

## CLAIMS

What is claimed is:

1. A method of processing transient errors produced in a color measurement system monitoring a color producing process, the method comprising:

implementing a model of the color producing process;

monitoring an input to the color producing process;

5 predicting an expected color signal based on the model and the monitored input;

measuring an output color produced by the color producing process to produce a measured color signal;

10 comparing the measured color signal to the expected color signal to produce a color error value, and;

selectively replacing the measured color signal based on the color error value.

2. The method of processing transient errors of claim 1 wherein selectively replacing the measured color signal comprises:

replacing the measured color signal with a predicted color signal based on the expected color signal.

3. The method of processing transient errors of claim 1 further comprising:

storing a measured color value representative of the measured color signal in association with the monitored input.

4. The method of processing transient errors of claim 1 wherein selectively replacing the measured color signal comprises:

replacing the measured color signal with an historical color signal based on an historical value related to the monitored input.

5. The method of processing transient errors of claim 1 wherein implementing a model of the color production process comprises:

selecting at least one of a refined parameterized Neugebauer model, a  
multidimensional numerical model and an on-line statistical parameterized model  
5 representative of the color producing process.

6. A method for calibrating a color reproduction device, the  
method comprising:

producing an image with the reproduction device in response to an  
input signal requesting the production of a target color;

5 measuring with a sensor, a color of the produced image, to generate a  
measured color signal value;

calculating an estimated color signal value based on the input signal;

validating the measured color signal value by comparing it to the  
estimated color signal value;

10 selecting a preferred color signal value from among at least the  
measured color signal value, and the estimated color signal value, based on the  
validity of the measured color signal value;

determining an error between the preferred color signal value and the  
target color; and,

15 selectively adjusting parameters of a control system of the color  
reproduction device to minimize the determined error for subsequently produced  
images.

7. The method for calibrating a color reproduction device of claim 6  
wherein calculating an estimated color signal value comprises:

using one of a Neugebauer model, a multidimensional numerical  
model and a regression of historical performance data of the color reproduction  
5 device, in conjunction with an input valued based on the input signal to generate the  
estimated color signal value.

8. The method for calibrating a color reproduction device of claim 6  
wherein validating the measured color signal value comprises:

determining a  $\Delta E$  value between the measured color signal value  
and the estimated color signal value;

5            comparing the magnitude of the determined deltaE value with a  
predetermined threshold deltaE value; and,  
             generating a validity assessment of the measured color signal value  
based on the comparison.

9.        The method for calibrating a color reproduction device of claim 6  
wherein selectively adjusting parameters of a control system comprises:  
             selectively adjusting at least one tone reproduction curve.

10.      The method for calibrating a color reproduction device of claim 1  
wherein selecting a preferred color signal value from among at least the measured  
color signal value, and the estimated color signal value further comprises selecting a  
preferred color signal from among the measured color signal value, the estimated  
5    color signal value, and a value generated from historical system performance data.

11.      A system including a color measurement sensor operative to monitor a  
color produced in a color producing process, the system comprising:

             a color producing process;  
             a model of the color producing process, the model and the process  
5    operative to receive an input and respectively produce a model color signal and a  
process output;

             a color sensor operative to produce a measured color signal  
representative of the process output color;

             a preferred signal selector operative to select a preferred signal from  
10    among at least the model color signal, and the measured color signal; and,

             a signal consumer operative to receive the preferred signal from the  
preferred signal selector.

12.      The system of claim 11 wherein the signal consumer comprises:  
             a system controller operative to up date system control parameters  
based on the received preferred signal.

13. The system of claim 11 wherein the color producing process comprises:

a color printing process.

14. The system of claim 11 wherein the color producing process comprises:

a plant hydration process.

15. The system of claim 11 wherein the color producing process comprises:

a textile dying process.

16. The system of claim 11 wherein the color producing process comprises:

a food processing process.

17. The system of claim 13 further comprising:  
a rendering device comprising at least one of a xerographic printer, an ionographic printer and an inkjet printer.

18. The system of claim 11 wherein the model of the color producing process comprises:

at least one of a refined parameterized Neugebauer model, a multidimensional numerical model and an on-line statistical parameterized model.

19. The system of claim 11 wherein the preferred signal selector is operative to select a preferred signal based on a difference between the measured color signal and a reference signal.